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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,128	09/10/2003	John Bruley	FIS920030230US1	2127
23550 7590 01/05/2005 HOFFMAN WARNICK & D'ALESSANDRO, LLC 3 E-COMM SQUARE ALBANY, NY 12207			EXAMINER WEISS, HOWARD	
			ART UNIT 2814	PAPER NUMBER
DATE MAILED: 01/05/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/605,128	<b>Applicant(s)</b> BRULEY ET AL.	
	<b>Examiner</b> Howard Weiss	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13, 14, 16-19 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13, 14, 16-19 and 21-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2814

Attorney's Docket Number: FIS920030230US1

Filing Date: 9/10/03

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Bruley et al. (Chan, Kirsch, Park)

Examiner: Howard Weiss

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 13, 14, 16 to 18 and 21 to 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. (U.S. Patent No. 6,277,681), Summerfelt et al. (U.S. Patent No. 5,609,927) and Muralidhar et al. (U.S. Patent No. 6,297,095).

Wallace et al. show most aspects of the instant invention (e.g. Figure 2, Column 2 Lines 6 to 36 and Column 3 Line 64 to Column 4 Line 27) including:

- cleaning a silicon substrate **11** using HF

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- generating a first silicon nitride layer **13** using  $\text{NH}_3$  and with a thickness between 5Å and 15Å
- depositing a high dielectric constant material of tantalum oxide **15** of thickness 15Å and 50Å
- generating a second layer **17** of silicon nitride in an ultra-high vacuum (between  $10^{-6}$  to  $10^{-2}$  Torr) and a thickness between 3Å and 8Å
- generating an electrode layer **19**

Wallace et al. do not show the use of silane and ammonia in the CVD of the second silicon nitride layer, the use of aluminum oxide for the high dielectric constant material, surface temperatures between 600-900°C and in situ cleaning of the aluminum oxide.

Muralidhar et al. teach to use silane and ammonia in the CVD of the second silicon nitride layer (Column 8 Lines 27 to 48) and the use of aluminum oxide (i.e. alumina) for the high dielectric constant material (Column 17 Lines 41 to 54) as to avoid leakage and reduce the required programming voltages. It would have been obvious to a person of ordinary skill in the art at the time of invention to use silane and ammonia in the CVD of the second silicon nitride layer and the use of aluminum oxide for the high dielectric constant material as taught by Muralidhar et al. in the process of Wallace et al. as to avoid leakage and reduce the required programming voltages.

Summerfelt et al. teach (e.g. Figure 1) to clean in situ a high dielectric layer **28** before deposition of other layers and to have surface temperatures of 600°C (Column 5 Lines 9 to 12) to reduce or eliminate the presence of hydroxide and carbonate compounds (Column 4 Line 57 to Column 5 Line 4). It would have been obvious to a person of ordinary skill in the art at the time of invention to clean in situ a high dielectric layer before deposition of other layers and to have surface

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temperatures of 600°C as taught by Summerfelt et al. in the process of Wallace et al. to reduce or eliminate the presence of hydroxide and carbonate compounds.

3. Claims 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al., Muralidhar et al. and Summerfelt et al., as applied to Claim 13 above, and further in view of Thakur et al. (U.S. Patent No. 5,913,149).

Wallace et al. , Muralidhar et al. and Summerfelt et al. show most aspects of the instant invention (Paragraph 2) except for the use of rapid thermal nitridation (RTN) and to do a thermal anneal. Thakur et al. teach (Column 5 Lines 13 to 36) to use RTN and to do a thermal anneal to produce a dielectric having reduced defects and enhanced electrical properties (Column 2 Lines 41 to 44). It would have been obvious to a person of ordinary skill in the art at the time of invention to use RTN and to do a thermal anneal as taught by Thakur et al. in the process of Wallace et al., Muralidhar et al. and Summerfelt et al. to produce a dielectric having reduced defects and enhanced electrical properties.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 13, 14, 16 to 19 and 21 to 24 have been considered but are moot in view of the new ground(s) of rejection. In response to applicant's arguments, the recitation of fabrication a capacitor has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.
7. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit

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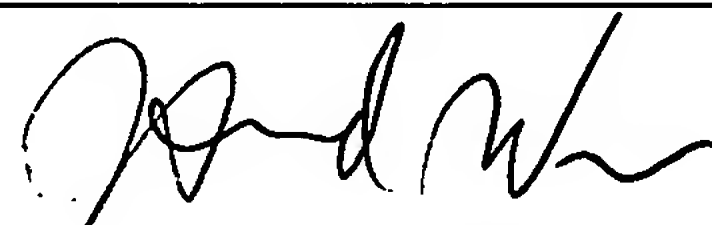
2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [Howard.Weiss@uspto.gov](mailto:Howard.Weiss@uspto.gov).

9. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 438/240, 791	thru 12/30/04
Other Documentation: none	
Electronic Database(s): EAST, IEL	thru 12/30/04

HW/hw  
30 December 2004



Howard Weiss  
Primary Examiner  
Art Unit 2814